Patent Claims

1. Method for the synthesis of nucleic acids, comprising the incubation of a polymerase, a nucleic acid that can serve as a template for the polymerase, NTPs and Mn^{2+} under conditions that permit the synthesis of a nucleic acid strand, **characterised in that** the conditions comprise a molar ratio of Mn^{2+}/NTP of not more than 0.7.

2. Method according to claim 1, **characterised in that** the polymerase is an RNA polymerase, preferably a DNA dependant RNA polymerase that needs a DNA template having a promoter to synthesize RNA.

3. Method according to claims 1 or 2, **characterised in that** the molar ratio of Mn^{2+}/NTP is between 0.2 and 0.6, preferably 0.3 to 0.5.

4. Method according to any of claims 1 to 3, **characterised in that** the total NTP concentration is between 4 mM and 24 mM.

5. Method according to any of claims 1 to 4 **characterised in that** the Mn^{2+} concentration is at least 3 mM, preferably at least 3.5 mM or at least 4 mM.

6. Method according to any of claims 1 to 5 **characterised in that** the Mn^{2+} concentration is between 4 mM and 17 mM.

7. Method according to any of the claims 1 to 6 **characterised in that** the polymerase is a T7 RNA polymerase, a T3 RNA polymerase or an SP6 RNA polymerase.

8. Method according to any of the preceding claims, **characterised in that** DNA or RNA is used as the nucleic acid that can serve as a template for the RNA polymerase.

9. Method according to any of the preceding claims, **characterised in that** DNA or RNA is used as the nucleic acid that can serve as a template for the RNA polymerase and this nucleic acid is present in an amount of at least 0.1 picogram (or 0.2 attomol, respectively) or in a concentration of at least 10 femtomolar.

10. Method according to any of the preceding claims, **characterised in that** ATP, UTP, CTP and/or GTP are used as NTPs.

11. Method according to any of the preceding claims, **characterised in that** also dNTPs can be used.

12. Method according to any of the preceding claims, **characterised in that** dATP, dTTP, dCTP and/or dGTP are used as dNTPs.

13. Method according to any of the preceding claims, **characterised in that** the NTPs or dNTPs can be used as derivatives, for example as biotinylated derivatives or coupled to a fluorescence label.

14. Method according to any of the preceding claims, **characterised in that** an amplification rate of at least 1000-fold, preferably at least 2000-fold, is achieved.

15. Kit for the synthesis of nucleic acids that comprises a polymerase, NTPs and Mn^{2+}, in one container or in several separate containers.

16. Kit according to claim 15, **characterised in that** the polymerase is a DNA dependant RNA polymerase that needs a DNA template having a promoter to synthesize RNA, wherein preferably a T7 RNA polymerase, a T3 RNA polymerase or a SP6 RNA polymerase is used.

17. Kit according to claim 15 or 16 **characterised in that** it comprises ATP, UTP, CTP and/or GTP as NTPs.

18. Kit according to any of claims 15 to 17 **characterised in that** it further comprises dNTPs.

19. Kit according to any of claims 15 to 18 **characterised in that** it comprises dATP, dTTP, dCTP and/or dGTP as dNTPs.

20. Kit according to any of claims 15 to 19 **characterised in that** it comprises NTPs or dNTPs in the form of derivatives, for example as biotinylated derivatives or coupled to a fluorescence label.

21. Kit according to any of claims 15 to 20 **characterised in that** it further comprises instructions for performing a Method according to one of claims 1 to 14.